CYPRESS–GUM SWAMP (INTERMEDIATE SUBTYPE)

Concept: Cypress–Gum Swamps are wet forests dominated by combinations of *Nyssa* and *Taxodium*, flooded for long periods by overbank flow from rivers or streams. The Intermediate Subtype covers examples where *Nyssa aquatica* and *Nyssa biflora* are both important components of the canopy or where *Nyssa aquatica* dominates along rivers or streams that are not brownwater rivers. They occur on rivers or creeks that have mineral sediment and pH levels between those of the Brownwater Subtype and Blackwater Subtype. This concept was included in the Blackwater Subtype of the Third Approximation but has been split out, narrowing the concept of the Blackwater Subtype.

Distinguishing Features: The Cypress–Gum Swamp type is distinguished by canopy dominance of combinations of *Taxodium* and *Nyssa* in a nontidal river floodplain setting that is not impounded. The Intermediate Subtype is distinguished from other subtypes by a canopy containing substantial amounts of both *Nyssa aquatica* and *Nyssa biflora* in a setting with some mineral sediment input. The distinction from Tidal Swamp (Cypress–Gum Subtype) can be subtle on the edges of tidal influence and where tidal flooding is primarily from irregular wind tides. However, *Morella cerifera, Juniperus silicicola,* and many herbs associated with Tidal Freshwater Marsh communities are good indicators of tidal conditions. Tidal swamps usually have a more open canopy created by stress from rising sea level, but this is not always the case.

The Intermediate Subtype is distinguished from Coastal Plain Small Stream Swamp, where occurring on small stream floodplains, by the strong canopy dominance by *Nyssa* or *Taxodium* throughout the community (sometimes *Acer rubrum* in successional condition). Coastal Plain Small Stream Swamp is reserved for floodplain communities having a more mixed forest composition driven by more microsite heterogeneity or by shorter hydroperiod. The 3rd Approximation was ambiguous about how to treat the uniformly wet small stream floodplains, but they should be classified as Cypress–Gum Swamp.

Synonyms: *Taxodium distichum - Nyssa aquatica - Nyssa biflora / Fraxinus caroliniana / Itea virginica* Forest (CEGL007432).
Ecological Systems: Atlantic Coastal Plain Small Brownwater River Floodplain Forest (CES203.250).

Sites: The Intermediate Subtype occurs on rivers or creeks that originate in the Coastal Plain but that have characteristics between those of brownwater and blackwater streams. This subtype is most typically along streams that drain clay-rich areas, but it may occur where limestone increases water pH. It may also occur locally along backwater creeks, where blackwater and brownwater mix. It may occupy the full width of uniformly wet small to medium floodplains or may occur in mosaics on floodplains with more topographic variation.

Soils: Most Intermediate Subtype occurrences have organic soils, usually mapped as Dorovan (Typic Haplosaprist). Some are mapped as Johnston (Cumulic Humaquept) and a few as the alluvial soils of brownwater floodplains.

Hydrology: The Intermediate Subtype is seasonally to frequently flooded, with hydroperiods comparable to other Cypress–Gum Swamp subtypes. It may stay flooded well into the growing season and may be flooded again during the growing season by major storms or wet periods. In most settings the water flows slowly or may become stagnant.

Vegetation: The Intermediate Subtype is either dominated by a mix of *Nyssa aquatica, Nyssa biflora*, and varying amounts of *Taxodium distichum* or by *Nyssa aquatica* with or without *Taxodium*. Other trees are scarce or absent from the canopy. The understory may include *Fraxinus caroliniana, Acer rubrum* var. *trilobum*, *Fraxinus profunda, Persea palustris, Carpinus caroliniana*, or *Ilex opaca*. Shrubs are generally sparse. *Eubotrys racemosa, Itea virginica, Viburnum nudum, Alnus serrulata, Ilex verticillata, Arundinaria tecta*, or other species may be present in small numbers. Woody vines are often abundant, including *Toxicodendron radicans, Smilax rotundifolia, Smilax walteri, Muscadinia rotundifolia, Berchemia scandens, Smilax glauca, Bignonia capreolata*, and *Campsis radicans*. Herbs range from nearly absent to moderate in density. *Boehmeria cylindrica* and *Saururus cernuus* are the most constant. Other herbs include *Hydrocotyle prolifera, Persicaria punctata,* other *Persicaria* species, *Hypericum walteri, Lorinseria areolata, Osmunda spectabilis, Bidens discoidea, Pilea pumila, Carex gigantea,* other *Carex* species, and, at least on the Waccamaw River, *Rhynchospora corniculata* and *Hymenocallis pygmaea*.

Range and Abundance: Ranked G3G4. In North Carolina, the Intermediate Subtype is most widespread in the northern part of the Coastal Plain and is scattered elsewhere. Many examples are on short streams that drain to estuaries, suggesting its abundance may decline with rising sea level. The synonymized NVC association ranges from Virginia to Florida. It apparently is more abundant than the Blackwater Subtype in states to the south.

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Associations and Patterns: The Intermediate Subtype most often occurs as large patches, filling featureless small to medium size floodplains. Many grade downstream to Tidal Swamp. A few occur in mosaics with other floodplain forests, which may be either blackwater or brownwater in character.

Variation: Too little is known to recognize variants. Differences between those on small floodplains and larger examples should be investigated. The large example on the upper Waccamaw River may be different from other examples.

Dynamics: The dynamics of this subtype are not specifically well known. The distinctive dynamics of *Taxodium distichum*, as discussed for the Brownwater and Blackwater subtypes, presumably apply to this subtype.

Because most examples of the Intermediate Subtype grade downstream to Tidal Swamp, their lower ends are subject to rising sea level and the inland extension of tidal influence. While the canopy initially remains the same, as saturation becomes permanent and flooding becomes more frequent, the lower strata change to those characteristic of Tidal Swamp. Over time, increasing stress leads to thinning of crowns and eventually increasing tree mortality.

Comments: The Intermediate Subtype is relatively recently recognized and needs further clarification. Plot data are not reliably attributed to it and many known sites are not well described, leaving only sparse vegetation data. Beyond the mix of canopy dominants, its vegetation seems more generally to be intermediate between the Blackwater and Brownwater subtypes, with a varying mix of the plants of both.

Nyssa aquatica - *Nyssa biflora* Forest (CEGL007429) is an association that has been created for mixed *Nyssa* swamps on the edges of brownwater floodplains. Scarcity of *Taxodium* is believed to be natural in this situation. It has been questionably attributed to North Carolina but no examples are known. It is unclear if it would be recognizable from the Intermediate Subtype described here, although the setting is different.

Rare species:
Vascular plants: *Sagittaria weatherbiana.*

References: